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NOTES ON LYTTA (BLISTER-BEETLES).

BY E. W. CLAYPOLE, YELLOW SPRINGS, OHIO.

During the present summer three species of *Lytta* have been very abundant and destructive here. The Striped Blister-beetle (*Lytta vittata*) in the early part of the season, about the end of June, began to do mischief to the Potato plants, especially where they were weedy. Later on, about the middle of July, this species was joined by the White-edged Blister-beetle (*L. marginata*), and both together fell upon the later kinds of Potato (in my garden the Buckeye). Now (August) the Black Blister-beetle (*L. atrata*) may be seen in company with the former two where a few belated plants afford them any green fodder. The last mentioned of the three, however, did not arrive in time to do any serious harm to the Potato, but turned its attention to a large bed of Sunflower belonging to my children, and are preying upon their yellow petals greedily. From twelve to twenty may be often seen upon a single plant.

All these three species "play 'possum" when frightened, but not all in the same way. The black one drops from the plant as does the Colorado Beetle (*D. 10-lineata*), but does not fold in its legs and antennæ and roll about. It lies just where it falls for some seconds, with limbs in the position in which they were when it dropped. The white-edged and striped species fall as if struck dead, but always alight on their feet or gain them immediately, and stand looking warily about them. If no danger seems near, or if an attack is made upon them, they run, and having the longest legs of the group, they run fast and are difficult to catch. But their bodies being soft, they are easily crushed. Their juices, as their name implies, are exceedingly blistering, and soon raise a water blister on the skin if applied to it. Hence they are often used locally as a substitute for the Spanish Fly.

The presence and voracity of these Blister-beetles make it very difficult to keep a bed of potatoes clean by hand-picking of any kind, but of course Paris Green or London Purple is as destructive to them as to the

Colorado Beetle, and forms the best remedy. They are so wary that it is almost enough to clear the plants if one walks between the rows so that one's shadow falls on them. They may be seen dropping to the ground in a shower.

Though these three species are so abundant here, I have not seen a specimen of the fourth member of the group, the Ash-grey Blister-beetle (*L. cinerea*), this summer, and a row of English Broad Windsor Beans which I planted as an experiment were quite untouched by them. The late Mr. Walsh says he never could grow these beans at Rock Island, Ill., because of the swarms of Ash-grey Blister-beetles which ate them up. My Broad beans were, however, badly injured by numbers of a small black hopping beetle, the name of which I do not know, but which treated their leaves exactly as the Turnip Flea Beetle treats the seed leaves of the young turnips. It was, however, much larger.

Not to paint the Black Blister-beetle any blacker than is just right, I must add that I not long ago found a swarm of them devouring the flowers of the great Rag-weed (*Ambrosia trifida*). One of them, which I watched for some time, cleaned the whole of the flowers from one of the involucre of the raceme in a few seconds.

DESCRIPTION OF A NEW SPECIES OF LIMENITIS.

BY W. H. EDWARDS, COALBURGH, W. VA.

LIMENITIS EROS.

Allied to *Disippus*, wings less produced, and in female very broad.

MALE—Expands about 2.6 inch.

Upper side very dark red-brown; hind margins bordered broadly with black, costal margins narrowly; inner margin of primaries black to the submedian nervure; all nervures and branches black, and narrowly edged with same color; against the end of cell on primaries a long subtriangular black patch, its short side resting on costa, its apex prolonged into a stripe which reaches the border of hind margin below first branch of median; beyond the disk on secondaries a transverse curved narrow black stripe from margin to margin; within the borders and near their inner edges a

common series of white spots, which on secondaries are small and more or less obsolete ; on the black triangle three white spots in line, the two nearest costa large, the third minute ; a white spot at the origin of upper subcostal interspace and a white streak on outer side of costal nervure opposite the triangle and a little way toward base ; fringes black, white in the middle of each interspace.

Under side red-brown, nearly as dark as above, and of an uniform shade over both wings ; the apical area of primaries a little less red ; primaries have the spots on border repeated, enlarged and crescent-shaped, white, with purple scales about the edges, and half way to margin is another series of small purplish spots, one to each interspace ; at apex these are round, the rest abbreviated streaks ; the spots in the triangle repeated, as well as the markings next and on costa, all these pure white ; in middle of cell next subcostal a subtriangular white spot on black ground, and a white mark along same nervure nearer base.

Secondaries have the marginal spots repeated, much enlarged, crescent, and an obsolescent row of purplish crescents on middle of the border ; the black transverse stripe repeated and on the inner side of same a crescent in each interspace, white, delicately tinted blue or purple.

FEMALE—Expands 3.2 to 3.4 inches.

Same color as male and similarly marked ; the black triangle shows a fourth spot ; in some examples the black cross stripe on upper side of secondaries has white crescents on inner side in the interspaces of anterior half the wing ; there is also a small white spot in cell of primaries next subcostal.

Under side like the male, but the white spots are greatly enlarged ; the crescents in borders almost serrated ; the white crescents inside the stripe always conspicuous and sometimes very large, exceeding indeed those of the border.

Several examples of this large and beautiful species were received by me last season from Indian River. It is allied to *Disippus*, from which it differs in the greater size of the female, in the very broad black borders in both sexes, in the depth of color, very nearly as dark as mahogany, above, and not much lighter below, and in the presence of white spots across the disk of secondaries, always on under side, and sometimes in ♀ on upper side also. My correspondent was able to obtain eggs by confining a female on willow, and these were forwarded to me in a tin box, and

though nine days on the road four larvæ reached me. One had just passed 2nd moult, one was swollen for 2nd moult, and two were in middle of second stage.

DESCRIPTION OF LARVA OF *L. EROS*.

Shortly before 2nd moult—Length .2 ; another .24 inch. Shape of *Disippus* at same stage, but the color red-brown, the sides darker ; the dorsal patch red-buff ; the processes on 3rd segment measuring .03 inch, stout at base, tapering to top, black, the knobs on their sides tawny.

After 2nd moult—Length .35 inch ; red-brown ; all the tubercles except those on the dorsal patch reddish, this patch yellow-buff ; the processes on 3 now .05 inch, black and as before.

After 3rd moult—Length .4 inch ; body very red ; the processes on 3 now .14 inch long, black, slender, bent forward at top ; many sharp thorns about the sides, and these as well as the stems are shining black, except the tips of the thorns, which are tawny ; the dorsal patch yellow-white. Duration of this stage 5 days.

After 4th moult (6 hours after)—Length .7 inch ; segments 2, 3, 4 red-tawny, clear colored, very little specked with black ; 5, 6, 7, 11, 12, 13 red-ferruginous, with little or no black ; the patch on 9, and partly covering 8 and 10, reddish-tawny ; the side stripe on basal ridge red-tawny, the processes on 3 vary from .2 to .26 inch long, slender, tapering regularly from base to top, their sides much covered with separated sharp spurs of irregular sizes ; the tips of these are tawny, but all else and the processes are shining black ; between these are two fine crested tuberculations, color of the ground ; on 4 are two large crests at the ends of the dorsal ridge, and two between these ; 5 has two small crests and three rows of red bead-like processes ; 6 has an elevated ridge with a mamilloid process at each end, the top crested ; the succeeding segments have but two dorsal tubercles to each, and to 11 they are small ; on the patch concolored ; 7 is beaded like 5, and 11 and 12 are much beaded ; 13 has two pairs of prominent processes, one quite at the extremity, and these are largest ; on 12 two large tapering processes crested at tops ; all crests are composed of little knobs like rice grains, and are red ; similar small crested tubercles on the sides, one row above, one below spiracles ; feet and legs red ; head obovoid, depressed at top, the vertices high ; color wholly red, except over mandibles across

the lower front, where it is reddish-black. Whole surface granulated and much covered with simple tubercles, roundly conical, and of irregular sizes; around the top and down the sides at back of head a row of sharp and pretty long spurs; all these red, as are nearly all in front, but a few are black both on front and sides; on each vertex a stout black process, short, the top rounded, and at base of the arch are six little rounded elevations; behind this process rises one of the spurs of the back head, overtopping it by .01 inch.

One day later, or 30 hours after the 4th moult, all the dark parts became paler, the red more brown, the face and head paler; the crests of all the dorsal tubercles and those on sides quite white.

Still one day later, the red parts were changing to olive-brown, and the red beads had become blue. The next day the dark parts were entirely green, mottled light and dark, the dark being olivaceous. The processes on 3 had not at all changed color from the first.

Five days after 4th moult, the larva suspended, having reached a length of one inch, and two days later pupated.

CHRYSLIS—Length 2.1 inch; head case sub-pyramidal; the vertices have each a low elevation, triangular; mesonotum high, rounded, with a thin low carina which rises to a blunt apex, sloping either way about equally; wing cases much elevated above the surface on the dorsal and posterior sides, the middle being incurved; on middle of dorsum rises a process, broad at base but rapidly narrowing to a sharp edge, rounded at top, not quite circular, the anterior part having a more rapid curve than the other; the space between the base of this and the wing cases corrugated; abdomen sub-cylindrical, a little compressed laterally, rising to a low medio-dorsal ridge; color of anterior parts, head and mesonotum brown; the dorsal side of head case imperfectly silvered; wing cases deeper brown, the raised ridges blackish; the dorsal process same color as the wings; at base on either side is an oblique black bar which crosses three segments, and the space between these and the wing cases is silvered on a whitish ground; abdomen buff, mottled with gray-green or olive-green, on ventral side covering quite uniformly, but on the rest the dark shades are faint and do not much discolor the light; the last segments dark, like head. Duration of this stage 8 days. Two of the larvæ reached maturity and gave two female butterflies.

Eros differs as much from *Disippus* in its larval stages as it does in the imago.

Eros, after 1st moult—Color red-brown; processes on 3 are .03 inch long, tapering to top, black.

After 2nd moult:

Color red-brown; processes .05 inch; black and tapering, with separated sharp spurs on sides.

After 3rd moult—Very red; the processes .14 inch long, black, slender, tapering, bent forward at top, scattered sharp spurs on sides, and except tips of these, all is shining black.

After 4th moult—Color red-tawny and ferruginous, processes in color as before, .2 to .26 inch, slender, tapering to top, not at all clubbed, bent, always thinly clothed with acuminate spurs quite to top (fig. 24, *a*).

Disippus at same stage—Color mottled tawny and dark brown; processes on 3 are .01 inch long, made up of several elongated knobs, some white, some black.

Color less tawny, much mixed with black; the processes thick, not tapering, but club shaped, wholly covered with knobs, mostly tawny, a little black.

After 3rd summer moult—Color black, the tops of all tubercles tawny; processes .06 to .07 inch long, club-shaped as before, tawny.

After 4th summer moult—Colors buff, black, red brown (but not red-ferruginous like *Eros*); processes tawny, sometimes mixed black, .12 to .22 inch, straight; the longer ones tapering for $\frac{3}{4}$ from base, then clubbed (fig. 24, *b*), the club thickly covered with fusiform knobs; the shorter ones club-shaped throughout (fig. 24, *c*) and thickly covered from base to top with fusiform knobs.

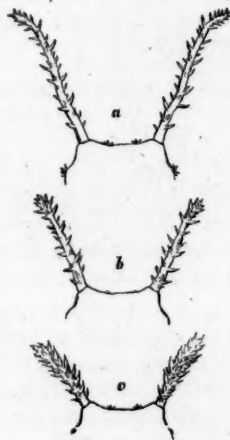


Fig. 24.

[The cut, by Mrs. Peart, shows the processes on 3rd segment of *Eros*, *a*, and of two mature *Disippus* bred at Coalburgh, 1880, *b*, *c*.]

Mrs. Peart made drawings of both *Eros* and Coalburgh *Disippus* larvæ, after 4th moult, and at same time, and writes me, that in addition to the remarkable difference in the processes on 3, the crests of the dorsal tubercles on *Eros* are composed of much larger grains and in greater number than in *Disippus*. She says: "The horns and the clusters of rice-grains, and the color of body are the chief points of difference."

Certainly a form which presents so conspicuous and permanent differences from *Disippus*, not only in the imago, but in the larval stages, is to be ranked as a distinct species.

I only know of *Eros* being taken in southern Florida, and it is the only form flying there so far as I know. Examples of *Disippus*, almost as dark as *Eros* on upper side,* come from northern Florida, and the Gulf States to Texas, but in these the under side of secondaries is but little darker than in many northern examples. (There is a strong contrast in *Disippus* in the color of the two wings below, secondaries being yellowish). Whereas in *Eros* both wings are of one red hue on under side, much like that of cherry wood.

On turning to the plate of *Disippus* in Boisduval and LeConte, which is taken from Abbot, I have little doubt that *Eros* furnished the examples from which the female represented was drawn. The shape is not that of the northern *Disippus*, as appears most decidedly by the figure of the under side, it being greatly broader, the fore wings less tapering, and so far this figure agrees with *Eros*. The colors are not deep enough for *Eros*, but apparently the under side is intended to be of an uniform shade. And inside the black cross stripe seem to be white crescents, very slight and half obscured by red paint in my copy, but they are dotted out by the engraver. In the text nothing is said of these crescents. The figure of the mature larva is roughly done, and can only represent the end of the stage after the colors have all changed, but the processes on 3 are very long and tapering, with separated spurs, and agree pretty well therefore with *Eros*. Boisduval refers to Fabricius, Ent. Syst. iii. 50 (*Misippus*), which merely says: "alis repandis fulvis; margine nigro albo punctato, posticis arcu nigro," and this is understood to cover the northern *Disippus*.

* *Disippus* var. a. *Floridensis* Strecker, Cat. p. 143. "The form found in Florida and other parts of the extreme South."

LIST OF SPECIES OF BUTTERFLIES RECEIVED FROM
FORT NIOBRARA, NEBRASKA.

BY W. L. CARPENTER.

<i>Pieris protodice</i> , Bois.	<i>Debis portlandia</i> , Fab.
<i>Colias eurytheme</i> , Bois.	<i>Satyrus nephele</i> , olympus, Edw.
<i>Nathalis jole</i> , Bois.	<i>Neonympha eurytris</i> , Fabr.
<i>Argynnis cybele</i> , Fabr.	<i>Thecla strigosa</i> , Harr.
“ <i>aphrodite</i> , Fabr.	“ <i>calanus</i> , Hubn.
<i>Euptoieta claudia</i> , Cramer.	<i>Lycaena comyntas</i> , Godt.
<i>Phyciodes nycteis</i> , Doubl.	“ <i>neglecta</i> , Edw.
“ <i>tharos</i> , Drury.	<i>Pamphila zabulon</i> , Bois.
<i>Grapta interrogationis</i> , Fab.	“ <i>manataqua</i> , Scud.
“ <i>comma</i> , dryas, Edw.	“ <i>huron</i> , Edw.
“ <i>progne</i> , Cramer.	<i>Pyrgus tessellata</i> , Scud.
<i>Limnitis Weidemeyerii</i> , Edw.	<i>Eudamus bathyllus</i> , Sm.-Abbot.
<i>Apatura celtis</i> , Bois.	“ <i>tityrus</i> , Fabr.

ON “THE WHITE SCALE OF THE ORANGE.”

(*Ceroplastes rusci* Linn.)

BY WM. H. ASHMEAD, JACKSONVILLE, FLORIDA.

BIBLIOGRAPHICAL.

Coccus rusci Linn., Sys. Nat.; Fab., Syst. Ent. (1775); Id., Spec. Ins. (1781); Id., Sys. Ryng. (1803); Id., Mantis. Ins. (1787); Id., Ent. Sys. (1794); Modeer., Act. Goth. (1778); Gmelin., Syst. Nat. (1791); Oliv., Encyc. Meth. (1791.) *C. caricae* Fab., Ent. Syst. (1794); Id., Syst. Ryng. (1804); Bernard Mem. Hist. Nat. et. Mem. Acad. (1775); Fonscol Ann. Soc. Ent. Fr. (1834); Boisduval Ent. Hort. (1868). *Lopus tessellata* Klein. (1734). *Calypticus testudineus* Costa (1837); Faun., Regn. Nap. Gallins. *Columnnea testudinata* Targioni (1866); Atti dei Georgof; Id., Studi Sulle Coccinig ext Soc. Ital. Scien. Milan et Catal (1868). *Signoret*.

This is another scale found by me infesting the orange trees in Florida. It has a wide distribution, being found in Europe, Australia and the southern parts of America.

Like the Long Scale (*Aspidiotus Gloverii*), it has probably been imported into this country, and but recently, as I can find no record of its having been found in Florida several years back. It is now just beginning to become common.

ITS FOOD PLANT.

M. Signoret, "Essai sur le Cochenilles," gives its food plants in Europe as the myrtle, common holly and wormwood. In Florida I have found it on the myrtle, orange, fig and oleander. Prof. J. H. Comstock, on his recent tour to Florida, told me he had found it also on the gallberry (*Ilex glaber*.)

The Scale, fig. 25, when fully matured, averages from .10 to .14 of an inch in length, by from .06 to .08 in width, and is highly arched. On the top it is tessellated with seven well-defined, oval, elevated checkers, three on each side, nearly round, the seventh, at posterior end, being more or less triangular. At first, the color is whitish, resembling wax, with which it is similar in consistency, being soft and pliable. As it reaches maturity it becomes pinkish with a slight yellowish tint in depressions; just before the young hatch, it becomes of a globular form, and the top changes to a dark brown.

The summer-brood of young hatch in from ten to twenty days after the eggs have been laid. The female is flattened, oval, resembling in shape the wood-louse, only not so convex. It is pale yellowish, with a brownish tint on back; antennæ six-jointed; in the posterior end is a deep triangular-shaped indentation, from the centre of which protrudes a fleshy tubercle, reaching to outer edge, and from each corner of the notch on either side of the tubercles issues a long filament nearly as long as the insect, Fig. 25. with a short hair on each side.

These crawl round for two or three days after hatching, searching for a suitable place to insert their beak. After inserting their beak they become stationary, and there soon after begins to form over them a waxy secretion in the form of small white globules, which is quite plainly visible in a few days in the form of small, white, round, elevated spots surround-



ing the insect, particularly just above the spiracles. As it increases in size, the limbs, which are of no more use, gradually disappear, and on reaching maturity it forms a brownish pupa, which on cutting open is found filled with eggs. These are elliptical, .01 of an inch in length, and of a pale yellow color. In one of the cases I counted one hundred and five eggs.

NUMBER OF BROODS.

During the year there are three broods; the first brood hatches from last of April to middle of May; the second, from middle of July to first week in August; the third, from last week of August to middle of September. One can form some idea of their prolificness, by supposing nothing prevents the first hundred eggs from hatching; this would give one hundred insects, which in turn produce their one hundred eggs, making in all 10,000 by second brood; these each producing a hundred would give a grand total of 1,000,000. One million—think of it—the produce of one scale insect in a year!

Thanks, however, to that immutable law which governs the universe, it has its enemies to prey upon and keep it from increasing too fast.

NATURAL ENEMIES.

The twice-stabbed Lady-bug *Chilocorus bivulnerus*, the blood-red Lady-bug *Cycloneda sanguinea*, and an ichneumon fly, are its principal foes. I have also detected a small white mite, about $\frac{3}{16}$ of an inch long, among the eggs and old scales; but whether it be an enemy or not I cannot say, as I have failed to detect it doing any damage. I'm inclined to think it merely feeds upon the decaying matter of the old scale.

I have not yet met with the male of this species, but hope to do so before long.

The cut will give an admirable idea of the scale.

NORTH AMERICAN MOTHS.

BY A. R. GROTE.

(Continued from Page 244.)

Oncocnemis levis, n. s.

Primaries much shaded with black over dusty ochrey. Markings fine, neat, distinct. The lines black, with narrow included dusty ochrey shades. Half-line present. Anterior line with three dentations. Claviform long,

reaching to posterior line, having a pale dusty ochre annulus edged outwardly with black, brown interiorly. Orbicular moderate, round, a little oblique with an interior brown annulet. Reniform upright lunate, pale dusty ochre, with an interior brown curved shade divided by a whitish hair-line on the cross vein. Posterior line curved, running inwardly below median vein, but not abruptly. The subterminal space is shaded with dusty ochre beyond the line. Subterminal line preceded by distinct long interspaceal black dashes. Terminal space narrow, shaded with black. A black terminal line; fringes pale at base, interlined. Hind wings dusty ochrey fuscous with distinct wide black borders; veins soiled with fuscous; beneath paler with traces of a mesial line and the black border repeated. On fore wings the black border is less vivid and there are blackish shadings on the cell and traces of an extra mesial line. Thorax and head colored like primaries; collar with a fine line in front, and double lines above. Fore tibiae with a terminal spine and a shorter one opposite; eyes naked. Length of primary 15 mil. *Hab.* Colorado, Mr. Neumoegen; several examples.

This species approaches *angustus* in ornamentation; the band on secondaries is broader and their color is darker, being ochrey fuscous, while in *angustus* they are whitish. The long black interspaceal dashes before the subterminal line are wanting in the Texan species, in which the claviform is vague and the orbicular spherical.

Since my first discovery of this interesting genus in North America it has been enriched by many species. In the European Catalogues four species are enumerated from the Altai and Ural regions. The following is a list of our species with localities:

Genus ONCOCNEMIS Led.

Hind wings yellow.

1. *Hayesi* Grote, Bull. B. S. N. S. 1, 105, pl. 3, fig. 13. Colorado.
2. *Dayi* Grote, Bull. B. S. N. S. 1, 105, pl. 3, fig. 8. Colorado.
3. *mirificalis* Grote, Bull. U. S. Geol. Surv. 5, 207. Nevada.

Hind wings soiled whitish or fuscous.

4. *levis* Grote, n. s. Colorado.
5. *Augustus* Harvey, Bull. B. S. 3, 73, pl. 3, fig. 5. Texas.
6. *Behrensi* Grote, Bull. B. S. N. S. 2, 65. California, in February.
7. *Glennyi* Grote, Bull. B. S. N. S. 1, 141, pl. 4, fig. 17. Colorado, in July.

8. *cibalis* Grote, n. s. Colorado.
9. *homogena* Grote, Bull. U. S. Geol. Surv. 3, 800. Colorado, Nevada.
10. *oblita* Grote, Bull. U. S. Geol. Surv. 3, 117. Nevada.
11. *Meadiana* Morrison, Proc. A. N. S. Phil. 1875, 60. Colorado.
12. *Chandleri* Grote, Bull. B. S. N. S. 1, 107, pl. 3, fig. 9; id. 3, 87; Bull. U. S. Geol. Surv. 3, 117. Colorado.
var. *riparia* Morr., Can. Ent. 7, 213. Long Island; Buffalo, N. Y.
13. *atricollaris* Harvey, Bull. B. S. N. S. 2, 273; id. 3, 73. Texas, Arizona.
14. *Saundersiana* Grote, Can. Ent. 8, 29. Canada.
15. *occata* Grote, Trans. Am. Ent. Soc. 5, 114; Bull. B. S. N. S. 3, 77, 87, pl. 2, fig. 6. Texas; California.
Hind wings black.
16. *aterrima* Grote, Can. Ent., 11, 199. California.

Of these sixteen species I have not been able to carefully examine *Meadiana*, the type of which is in Mr. Tepper's collection. It seemed to me different from any of the others, although the specimen is not in fine condition. *O. aterrima* is aberrant in color and appearance; *Behrensi* is allied to the European *confusa*; *atricollaris* looks like a *Homohadena*, as which it was originally described. The variety of *Chandleri* which I have collected near Buffalo, and which is called *riparia* by Mr. Morrison, does not differ by the hind wings, but may be recognized by the paler gray primaries and the white marked subterminal line; the terminal black interspaceal dashes are also wanting. My single (♀) Buffalo specimen now before me is more aberrant from *Chandleri* than Mr. Morrison's type of *riparia*, or another Buffalo specimen collected by Miss Walker, to which I have alluded Bull. U. S. Geol. Surv. 3, 117. More material is evidently needed to decide on the value of *riparia*, which is our only Eastern example of the genus.

Homohadena chorda, n. s.

Fuscous gray. Front and palpi pale; fore wings shaded with pale gray over the median space inwardly obliquely, and beyond the posterior line narrowly and irregularly. Half-line present. Anterior line rather thick, arcuate, a little uneven. Reniform vague, small and pale. Posterior line narrower than anterior, a little uneven, nearly straight, not as much inflected as usual. Subterminal line preceded by a diffuse black shading. Terminal space fuscous. Median shade indicated by a black

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costal spot, below which it is thread-like, hardly noticeable. Hind wings whitish with broad black borders, veins soiled; beneath with black border, within which indications of a narrow mesial line. Collar and thorax concolorous fuscous gray. Vertex between the antennæ black. Length of primary 15 mil. *Hab.* Colorado.

Homohadena fortis, n. s.

Thorax smoothly haired; abdomen untufted. Size large. Of a dusty fuscous, paler than *incomitata*. Basal dash obsolete; no dash on median space. Median lines accentuated on the veins, very narrow, black and single. Anterior line perpendicular. Posterior line with a rather long and narrow extension beyond the disc; lunulate between the veins, which are marked with black points. A succession of pale marks preceded by very slight black dashes indicates the subterminal line. A row of terminal black points. Fringes shaded, paler than the wing. Hind wings white, sub-pellucid; the nervules soiled; a vague terminal fuscous shading; fringes whitish. Head and collar darker shaded than the thorax, dusky fuscous. Stigmata indicated by paler shading; orbicular ovate, elongate; reniform moderate, upright; claviform indicated. *Expanse* 40 mil. *Hab.* Nevada.

Homohadena picina, n. s.

Thorax and primaries unicolorous dusky fuscous; the median lines indicated by venular dots, incomplete; the posterior line not as flexed as usual; fringes concolorous. Hind wings whitish at base, washed with fuscous exteriorly, the veins soiled; faint traces of a mesial line. Beneath the secondaries are paler, with a distinct dotted line. Eyes naked; body untufted; tibiæ unarmed. A stout, obscurely colored and simply marked form. *Expanse* 40 mil. California, Mr. Hy. Edwards, No. 7174.

The genus *Homohadena* has the facies and untufted body of *Oncocnemis*, but differs by the absence of the tibial claw. Our species are as follows:

HOMOHADENA Grote.

Type: *H. badistriga*.

1. *atrifasciata* Morrison, Proc. A. N. S. Phil. 1875, 431; Grote, Can. Ent. 10, 234. Maine; Northern N. Y.
2. *chorda* Grote, n. s. Colorado.
3. *badistriga* Grote, Bull. B. S. N. S. 1, 181; Check List 1, pl. 1, fig. 5; Lintner Ent. Contrib. 4, 93 (*larva*). Middle States.

4. *kappa* Grote, Trans. Am. Ent. Soc. 92, Sept., 1874; ? *retroversa* Morr., Proc. Bost. S. N. H., 157, Dec. 1874. Kansas; Mo.; Texas.
5. *figurata* Harvey, Can. Ent. 7, 117. California.
6. *induta* Harvey, Bull. B. S. N. S. 2, 274. Texas.
7. *incomitata* Harvey, Can. Ent. 7, 136; id. Bull. B. S. N. S. 3, 6. Texas.
8. *fortis* Grote, n. s. Nevada.
9. *picina* Grote, n. s. California.

Charadra palata, n. s.

♂. Eyes hairy; antennæ bipectinate, testaceous. Gray; black and white. Aspect of a *Raphia*. Anterior line black, widely outwardly bent, irregularly arcuate. A black median shade line; a black dash on submedian space connecting the oblique propinquitous median lines. Stigmata whitish, black-ringed with central dot and streak; sub-equal. Subterminal line sinuate, black, indented opposite the cell, followed by a white shade. Hind wings pure white with the fringes. Thorax gray. Ocelli present. *Expanse* 38 mil. Colorado.

Slighter than the other species and differing decidedly by the more even and oblique transverse lines.

Our four species of *Charadra* Walk., a North American genus allied to the European *Trichosea ludifica*, differing by the pectinate antennæ of the male, the longer palpi, the ornamentation and color, may be catalogued as follows: *deridens* Guen.; *dispulsa* Morr.; *palata* Grote; *propinquilinea* Grote. No species are known from California; Mr. Morrison's *decora* is Central American, its given locality incorrect; it may be the *Diphthera cavillator* of the British Museum Lists.

ENTOMOLOGY FOR BEGINNERS.

Some Fungi-Eaters.

BY W. HAGUE HARRINGTON, OTTAWA, ONT.

It is related by a celebrated traveller and naturalist that, in the dreary islands of Terra del Fuego, the only vegetable food to be obtained by the wretched inhabitants, with the exception of a few berries, is a fungus which grows in great abundance on certain trees. This fungus appears

on the bark in the shape of bright yellow, globular masses of the size of small apples, and at a certain stage of development is gathered and eaten uncooked. Other savage tribes inhabiting barren territories may be partially dependent on similar substitutes for the nutritious roots and succulent fruits used by more favorably located races; but civilized man, with his long list of food plants to choose from, considers fungi more as luxuries than as essential articles of diet.

The common field Mushroom (*Agaricus campestris*), found wild throughout the greater part of the world, ranks high as a table delicacy, and is largely cultivated in some countries. Several other species of fungi are also used in considerable quantities; for instance, the famous Truffle, which grows several inches below the surface of the ground, and requires to be hunted with the aid of dogs trained to scent them out. Many others, likewise very wholesome and palatable, are, however, seldom used because of their resemblance to poisonous varieties.

We find man not alone in his liking for fungi and his use of them as food. Domestic cattle and many wild animals also relish them and devour species shunned by man. The insect world produces a great variety of species subsisting either in the larval or perfect state, or in both, upon fungus. Often when a fine, fresh-looking, pink-gilled, snowy-clad Mushroom is plucked, the picker finds, much to his disappointment and disgust, that his savory morsel is already "food for worms." A number of small grubs are feasting within the stalk, and in a few hours the cherished Mushroom becomes a black decaying mass, filled with little maggots.

A great variety of fungi are similarly attacked and made the banqueting chambers of numerous foes. The tender, short-lived species, such as Mushrooms and Toadstools, decay and perish quickly, but the harder kinds, growing upon old and dead or fallen trees, harbor their tenants much longer, and preserve their shape and outward comeliness even after they have been eaten and withered away inwardly.

The object of this brief paper is to call the attention of any who have recently commenced collecting to the fact that fungi are so much frequented by insects, and that many species can be obtained from them with but little trouble. I will therefore briefly mention a few of the numerous Coleoptera which I have taken on or in fungus; not because they are rare beetles, but rather because they may be easily obtained and are well known.

Megalodacne heros is the finest beetle which I have found feeding upon fungus. It belongs to the Erotylidæ, a family known by the large antennal club, formed by an enlargement and flattening of the three last joints. This family is said to be largely developed in tropical America, where its members are mostly leaf-eating beetles, differing in this respect from northern species which live upon fungi. One day last summer (9th June) I met with a number of large chocolate-colored fungi growing upon the roots and bark of the stumps of some large Hemlocks recently felled. Hiding in crevices of the bark, or in the damp chips and leaves from amidst which the fungi on the roots were springing, I discovered numerous specimens of this handsome beetle and collected about thirty, which had been recently feeding upon the fungus, as evidenced by the holes gnawed therein.

The beetles varied much in size, being from four to seven-eighths of an inch long. They are of an elongated oval shape, three times as long as broad. The head, bearing the distinguishing club-tipped antennæ, is inserted to the eyes in the almost square thorax. The beetle is broadest across the base of the elytra, which taper gradually and are rounded off at the tip. Each elytron is marked by two orange patches; the one at the base is somewhat in the form of a Maltese cross with the lower arm broken off, but varies in different specimens; the other is an irregular band about one-third the distance from the tip. With these exceptions the beetle is of a jet black, highly polished, and is a handsome insect. About six weeks later I visited the same locality in the expectation of obtaining some more of these fine beetles, but could find none. In some fresh fungi of the same kind I found numbers of large stout grubs, from one-half to over three-quarters of an inch long, with a broad black band across the top of each segment. They were probably the larvæ of this beetle, but as I did not succeed in rearing any of those I took, and could not visit the place again, they may have been those of some fungi-eating Tenebrio, to some larvæ of which family they had much resemblance.

From the same fungi from which I had previously taken the above-mentioned beetles, and which were now hard and dry, I obtained nearly forty specimens of *Bolitotherus cornutus*, the majority females. This beetle belongs (with the two species next to be described) to the Tenebrionidæ, the members of which family live chiefly in or about dead stumps and logs, hiding in crevices or under bark, fungus and moss. It is a dark brown or dull black beetle, thickly covered with tubercles, so

that it looks like a bit of rotten bark or dry earth and easily escapes detection when it drops to the ground with its legs tightly folded. The male has two horn-like projections upon the thorax and also two minute ones on the front of his head. Those on the thorax are more than an eighth of an inch long, flattened inwardly at the end and fringed with a light pubescence. The beetles are found abundantly during the summer and autumn, feeding upon the large woody fungi which spring from stumps and decaying trees. While the beetles are found imbedded in holes gnawed in the surface, the larvæ in different stages will be obtained by breaking apart the fungus, in which they burrow out cells until the whole mass is full of holes and tunnels filled with excrement. The grubs are long and cylindrical, attaining when full grown a length of three-quarters of an inch, and have two spines on the last segment, as have the larvæ of many species of this family.

Diaperis hydni is a small stout beetle, a quarter of an inch long, common in fungus growing upon old and decaying Beech trees (such as are infested by *Dicera divaricata* and *Tremex columba*). It is very smooth and glossy, and is jet black with the exception of the elytra. These are light brown and are marked by two small black dots just behind the thorax and by two larger ones midway between these and the tip. They are also ornamented by lines of minute punctures, hardly visible to the naked eye, and not interrupting the glistening appearance of the beetle.

Hoplocephala bicornis is a little dark greenish beetle, found in great numbers in the dry leathery fungus which grows, like overlapping scales, on hardwood stumps. Although this beetle is less than one-fifth of an inch long, the male may be easily distinguished by the two little spines or horns which he bears on his head, and from which the species derives its name. They soon reduce the dry fungus to a white powdery state.

Mycelophagus punctatus is abundant in the fresh, soft, white fungi which grow from the bark of various trees, not in compact masses, but laminated or gilled beneath like Toadstools. On giving the tree a smart tap the beetles will shower down from between the gills upon a beating net held below. They are nearly one-fourth of an inch long, and are black, except the yellowish elytra, which are marked by a black spot surrounding the scutellum, a black band across near the tip and two black spots midway between this band and the thorax. Associated with them are generally found numbers of a smaller but very similarly colored species, *M. flexuosus*.

Similar fungi will sometimes be found to contain a great many very slender little white grubs, with a black head no larger than a pin hole. I have seen them twisted together in such lumps that the black heads seemed like some tiny mites creeping about over the wriggling mass, in which the respective bodies were lost. These are the larvae of *Triplax thoracica*, a reddish beetle, one-fifth of an inch long, with blue-black elytra, belonging, like the first beetle described, to the Erotylidae.

Penthe obliquata is a very active beetle which scampers hastily away when disturbed at its fungus feast or in its hiding place under bark, and thus frequently eludes its discoverer. It is of a deep dull black, only relieved by the reddish yellow scutel and a yellow apical joint to the antennae. The elytra are very densely and irregularly punctured. This fine beetle is half an inch long and almost oval in shape. A rarer and slightly larger, but not so handsome insect, is *P. pimelia*, which I have found under the bark of old trees. It is of a dull brownish black, and has the elytra more evenly and less densely punctured. As it lacks the yellow scutel, it is easily distinguished from the preceding species.

Many Staphylinidae are found in the stalks of Toadstools and in other fungi, while those of many other families resort to these productions either for an occasional meal or for a life-long diet. Such are *Cratoparis lunatus* among the Weevils, and *Onthophagus hecate* of the Scarabeans. To even enumerate these would require much space, but I think I have already written enough to show that the young collector will find it profitable to search the different fungi for specimens, especially early and late in the year, when other feeding grounds are unproductive. I might add that many insects in turn fall victims to fungi. The house-fly is a familiar instance of this, and every fall we see great numbers of them stick to our walls and windows, their bodies distended by the fungus, which also spreads some distance around them.

CORRECTION.—I desire to correct an error in my late Annual Address to the Entomological Society of Ontario, to which my attention has been called by Prof. C. V. Riley, in reference to the larval habits of the black blistering beetle, *Epicauta pennsylvanica*. On page 196, CAN. ENT., I stated that "the larva of this insect is found only in the nests of bees, wasps, &c., where it feeds on the young of these nest-making insects."

This was, I believe, until a comparatively recent period the view universally held by Entomologists. In the First Annual Report of the U. S. Ent. Com. relating to the Rocky Mountain Locust, published in 1878, Mr. Riley states that he has found the larva of this species, *E. pennsylvanica*, along with those of other species of the same genus, feeding on the egg masses of the Rocky Mountain Locust, *Caloptenus spretus*, and has bred the perfect insect therefrom. This statement had escaped my notice.

WM. SAUNDERS.

CORRESPONDENCE.

DR. HAGEN'S MYSTERY.

DEAR SIR,—

My writings on *Pronuba yuccasella* have induced considerable discussion and comment, both from horticulturists and entomologists. Many of the criticisms of my conclusions are unworthy of notice and have not been noticed by me; but the note from Dr. Hagen in your July number cannot be passed in silence. Just as I had, in the June and July numbers of the *American Entomologist*, dispelled much of the "mystery" regarding this little moth and shown that the conflicting experiences were due to the confounding, by my critics, of another species (*Prodoxus decipiens*) with it, Dr. Hagen increases the "mystery" by his statements in the note referred to. His statements are positive and circumspect, but I am as fully satisfied that he has in some way made a mistake as I am that others have been mistaken who wrote with equal assurance on the subject of *Pronuba*. I have obtained in all from the stems of *Yucca* some forty specimens of *Prodoxus*, none of them showing any sign of the maxillary tentacle of *Pronuba*, and it would be strange indeed if Dr. Hagen's two individuals formed such a remarkable exception. I write this upon first reading his note, but as I expect shortly to have the privilege of examining the specimens, I will wait and see what light I can then throw upon this last "mystery."

Regarding Dr. Hagen's unwillingness to send me a specimen of the *Yucca* stem larva, I have simply to say that upon learning from Mr. Thomas Meehan that he had sent to Dr. Hagen what, from my previous experience with it, I thought was probably *Prodoxus decipiens*, I greatly

desired to ascertain whether it was so or whether my friend was right in considering it Coleopterous—the determination being important in the light of previous published statements by Mr. Meehan. I do not see how the gratification of my desire would have in any way interfered with Dr. Hagen's intended publication, and when, after sending him a *Prodoxus* larva and asking him to tell me whether his was identical or different, no reply came, I was forced to seek the information elsewhere. Mr. Meehan kindly sent me some infested stems from the same lot as those sent to Dr. Hagen, and from them I at once recognized *Prodoxus*, and from them even bred the moths, which did not have the characters of *Pronuba*.

C. V. RILEY.

C. V. RILEY.

Washington, D. C., Aug. 16, 1880.

P. S.—As a post script to what I have previously written regarding Dr. Hagen's note on *Pronuba yuccasella*, I wish to say that upon meeting him he at once admitted his error, and I leave him to explain it.

Boston, Mass., Aug. 23, 1880.

C. V. R.

I have to note the capture of *Hadena confederata* Gr. on Staten Island in October. This species I have originally described from Louisiana and Texas. My friend, Mr. Thaxter, has taken it also at the same time in Cambridge, Mass. It is a Southern form, coming northward in the fall. Mr. Thaxter caught it in Jamaica, N. S. Mr. Thaxter has also bred the *Spanish Moth*, *Euthisanotia timais*, in Florida. A. R. GROTE.

A. R. GROTE.

During August I had a three weeks' hunt about Ridgeway, and a finer place for the purpose I have never been in. I brought home one *Catocala* new to me, small size. One day I saw a little beauty sitting on a tree, which I took for a *Catocala*, but it is *Ephesia elonympha*, a perfect gem in its way. We came across three butterflies I never saw alive before: *Papilio marcellus*, *P. philenor* and *Junonia coenia*. We took but one of each; also one specimen of *cresphontes*. Some fine flies taken on the lake shore; beautiful specimens of the banded *Midas*, and a large red one I had not seen before.

The sand seemed full of the larvae of the Ant Lion, but it was too early for the mature insect. I took one specimen of *Myrmelion abdominalis* at Long Point, and one of a species I don't know.

Hamilton, Aug. 10, 1880.

J. ALSTON MOFFAT.

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